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EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 05/06/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n N .

09/740,830

Examiner

Michelle Crowell

Applicant(s)

PARK, IL RYONG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-10, and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-10 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 and 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification for the following claim recitation: "the etch/strip apparatus is a single piece of equipment". Merriam-Webster's Collegiate Dictionary states that the definition of single is consisting of or having only one part, feature, or portion. The specification and Figure 3 show that the invention comprises several pieces of equipment (etch, rinse, strip, transfer, and cleaning stations). On page 6 of the specification, an etch/strip apparatus unified with cleaning equipment is disclosed as the invention. Merriam-Webster's Collegiate Dictionary states that the definition of unitary (unified) is characterized by unity, units, or whole. Therefore, specification only supports having **plural** pieces of equipment connected to create a unified (whole) system, and not a **single** piece of equipment.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The structure of the pipe shower is unclear. For purposes of examination, the term “pipe shower” has been interpreted to be a means for inserting a fluid.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3-9, and 12-14 rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki (Japanese Patent Publication 09-106978).

Referring to Drawing 1 and paragraphs [0014-[0019], Miyazaki discloses integrated processing apparatus comprising an etch chamber 4 (etching line), stripper 8 (stripping line) and rinse room 11 (cleaning line) on the stripping line.

As seen in Drawing 1 and abstract, an elevator is used to move the wafers from the stripper 8 to the rinse room 11. More specifically, the elevator conveys the wafer from stripper 8 to the storage room 6, to the wafer transfer machine 10, and then to the rinse room 11.

Regarding claims 3 and 9, wafer transfer equipment 5 (transfer module) moves the wafers from the etch chamber 4 to the stripper 8.

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Regarding claims 4, 5, 8, and 12-14, a load lock chamber 3 (loader) feeds the wafers into the etch chamber 4 (paragraph [0014]). Wafers are sent from the etch chamber to the rinse room 11. After the cleaning process, the wafers are sent to the unloader (paragraph [0019]). Both the loader and the unloader use a conveyor to transfer the wafers (paragraph [0019]).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki (Japanese Patent Publication 09-106978) in view of Iwai et al. (Japanese Patent Publication 06-224145).

The teachings of Miyazaki are discussed above.

Miyazaki fails to specifically teach a pipe shower in the transfer module.

Referring to the abstract, Iwai teaches that it is known to provide a transfer module 13 with a pipe shower 71. By using a pipe shower 71, the transfer module is prevented from reaching high temperatures and films are inhibited from forming on the wafer inside the transfer module. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a pipe shower as taught by Iwai to the apparatus of Miyazaki. This would prevent the transfer module from reaching high temperatures and inhibit films from forming on the wafer inside the transfer module.

9. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki (Japanese Patent Publication 09-106978) in view of Toshima (U.S. 6,007,675).

The teachings of Miyazaki are discussed above.

Miyazaki fails to teach that the stripping line and the cleaning line are stacked to have a two-tier structure.

Referring to Figure 6a and column 21, lines 40-65, Toshima teaches that it is well known to move wafers from a dry-stripping module 6000 to a wet-cleaning module 7000 using a wafer elevator car 1401 of a wafer elevator 1400. This mechanism, like a robot arm or conveyor, allows the wafers to proceed to next processing module without interruption. In addition, Toshima teaches having a dry-stripping module and a wet-cleaning module stacked in a single system, which saves space and a wafer exchange step, i.e. time, normally used with linear etch/clean systems. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to stack the stripping line with the cleaning line of Miyazaki as taught by Toshima. This would allow the wafers to proceed to next processing module without interruption, save time, and reduce the footprint of the equipment.

10. Claims 1, 3-9, and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeOrnellas (U.S. 5,672,239) in view of Toshima (U.S. 6,007,675).

Referring to Figures 1 and 2, and column 3, lines 7-31, DeOrnellas discloses an integrated processing apparatus comprising two etch modules 20 and 22 (etching line), strip module 24 (stripping line) and rinse module 25 (cleaning line) on the stripping line. Load lock chamber 16 (loader) holds the wafers before processing and atmospheric cassette module 34

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(unloader) holds the wafers after processing. Furthermore, the atmospheric cassette module 34 contains a robotic wafer handling system 32 (robot) for transferring wafers from a rinsing (cleaning) module 25 to an atmospheric cassette module 34. The vacuum chamber 26 (transfer module) connected to the load lock chamber 16 uses a robotic wafer handling system 38 (robot) for transferring the wafers to the various modules (etching and stripping). Overall, DeOrnellas discloses a single, integrated system which performs multiple processing functions (etching, cleaning, and stripping) (col. 2, lines 26-30).

After the wafer is etched, a pre-strip rinse step and spin-dry step takes place in the rinse module 25. This prevents corrosion and the oxidizing of residues into insoluble oxides during photoresist stripping. Likewise after the stripping process, the wafer undergoes a final rinse and dry step (col. 4, lines 5-16).

DeOrnellas fails to teach an elevator for conveying the substrate from the stripping line to the cleaning line, a pipe shower, and a stripping and etching line stacked in a two-tier structure .

Referring to Figure 6a and column 21, lines 40-65, Toshima teaches that it is well known to move wafers from a dry-stripping module 6000 to a wet-cleaning module 7000 using a wafer elevator car 1401 of a wafer elevator 1400. This mechanism, like a robot arm or conveyor, allows the wafers to proceed to next processing module without interruption. In addition, Toshima teaches having a dry-stripping module and a wet-cleaning module stacked in a single system, which saves space and a wafer exchange step, i.e. time, normally used with linear etch/clean systems. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of DeOrnellas with an elevator and a stacked

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stripping/cleaning system as taught by Toshima. This would allow the wafers to proceed to next processing module without interruption, save time, and reduce the footprint of the equipment.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeOrnellas (U.S. 5,672,239) in view of Toshima (U.S. 6,007,675) as applied to claims 1, 3-9, and 12-16 above, and further in view of Iwai et al. (Japanese Patent Publication 06-224145).

The teachings of DeOrnellas in view of Toshima have been discussed above.

DeOrnellas in view of Toshima fail to teach a pipe shower

Referring to the abstract, Iwai teaches that it is known to provide a transfer module 13 with a pipe shower 71. By using a pipe shower 71, the transfer module is prevented from reaching high temperatures and films are inhibited from forming on the wafer inside the transfer module. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a pipe shower to the apparatus of DeOrnellas in view of Toshima. This would prevent the transfer module from reaching high temperatures and inhibit films from forming on the wafer inside the transfer module.

### ***Response to Arguments***

12. Applicant's arguments filed September 3, 2002 have been fully considered but they are not persuasive.

14. Applicant has argued that the specification would enable a person having ordinary skill in the art to make and/or use the invention as is set forth in independent claims 1 and 6 (i.e.



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“apparatus is a single piece of equipment). The specification only supports having **plural** pieces of equipment connected to create a unified (whole) system, and consequently there is no support in the specification for a **single** piece of equipment. Therefore this limitation is considered new matter and the corresponding arguments are moot.

15. Applicant has argued that a pipe shower is so evident that a person having ordinary skill in the art would know how to make and use this embodiment without undue experimentation.

However, it must be emphasized that arguments of counsel alone cannot take the place of

evidence in the record once an examiner has advanced a reasonable basis for questioning the disclosure (*In re Knowlton*, 500 F.2d at 572, 183 USPQ at 37; *In re Wiseman*, 596 F.2d 1019, 201 USPQ 658 (CCPA 1979)). In this case, no structure of the pipe shower has been disclosed, nor how the pipe shower functions to prevent drying. However, for purposes of examination, the term “pipe shower” has been interpreted to be a means for inserting a fluid.

16. Applicant has argued that DeOrnellas fails to disclose an elevator. As stated above,

DeOrnellas in view of **Toshima** teaches an etch/strip/cleaning system with an elevator. Toshima specifically discloses the benefits of using an elevator. In addition, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

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17. Applicant has argued that the system of DeOrnellas fails to disclose an apparatus that is a single unit. In column 2, lines 26-30, DeOrnellas discloses a single, integrated, small footprint system (unit) which performs multiple processing functions (etching, cleaning, and stripping).

18. Applicant has argued that the apparatus of DeOrnellas is fundamentally different than the unified transfer line shown in Figure 3 of the invention. All of the claimed features are taught by DeOrnellas in view of Toshima. The apparatus of DeOrnellas is not required to look like Figure 3. DeOrnellas simply must teach the claimed invention.

19. Applicant has argued that a person of ordinary skill in the art would not be motivated by the teachings of DeOrnellas combined with Toshima to produce the claimed embodiment of the invention wherein "apparatus is a single piece of equipment". First of all, Merriam-Webster's Collegiate Dictionary states, that the definition of unitary (unified) is characterized by unity, units, or whole. Therefore, the applicant's specification and the DeOrnellas reference teach having plural pieces of equipment connected to create a unified (whole) system. Secondly, the motivation to combine DeOrnellas with Toshima is as follows: By using an elevator in a strip/clean module stacked within a single system, a smaller footprint is achieved, overall processing time is reduced, and therefore, wafer throughput is increased. Thirdly, there is no support in the specification for one piece of equipment, therefore this limitation is considered new matter and the corresponding arguments are ultimately moot.

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***Conclusion***

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shambelan and Maejima teach an etch/strip/clean apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC ame

*Alejandro*  
Luz L. Alejandro  
Primary Examiner  
Art Unit 1763